

2015

MICROBIOLOGY

[Honours]

PAPER – I(New)

Full Marks : 90

Time : 4 hours

*The figures in the right hand margin indicate marks
Candidates are required to give their answers in their
own words as far as practicable*

Illustrate the answers wherever necessary

[NEW SYLLABUS]

GROUP – A

Answer any two questions : 15 × 2

1. (a) "Louis Pasteur is called the 'Founder of Microbiology'." Justify the statement. From which organism Alexander Flemming discovered penicillin ? 5 + 1

(b) State the roles of microbes in respect of biofertilizer and biopesticides. 5

(c) Name one plant disease and one human disease caused by respective bacteria. 2 + 2

2. (a) Who proposed 3-kingdom system of classification? What are the kingdoms? What are the basis and drawbacks of Haeckel's system of classification?

$$1 + 1\frac{1}{2} + 2\frac{1}{2} + 2$$

(b) What is single cell protein? State the drawback of SCP. 2 + 2

(c) Name two protozoal diseases in human by mentioning their respective causative organism. 2 + 2

3. (a) What are the aims of sterilization and Pasteurizations? Differentiate synthetic and semi-synthetic and complex medium with suitable example. 2 + 5

(b) State the principle of phase contrast microscope. What is the utility of this microscope in microbiology? 3 + 1

- (c) Describe the dilution plate technique for obtaining pure culture. 4
4. (a) What do you mean by stain ? What are acid stain and basic stain ? Give one example of each type. Why is negative staining done ? $1\frac{1}{2} + 2 + 2 + 1\frac{1}{2}$
- (b) State the theory of Gram staining. Name the stains which are used in acid fast staining and endospore staining. 4 + 2
- (c) Mention the role of mordant in Gram staining. 2

GROUP – B

Answer any **five** questions : 8 × 5

5. What is glycocalyx ? Compare the cell wall structure of Gram positive and Gram negative bacteria. State the function of pili. 2 + 4 + 2
6. Briefly describe the sexual reproduction in *Rhizopus*. State the economic importance of this genus. 6 + 2

7. Briefly describe the mode of reproduction of HIV. 8
8. Give the schematic representation of eubacterial cytoplasmic membrane. State its functions. 3 + 5
9. What are antibiotics and antibiosis? Describe the mode of action of any one antibiotic which affect cell wall biosynthesis. $1\frac{1}{2} + 1\frac{1}{2} + 5$
10. What is batch culture? Why it is called 'closed system'? Draw and label the different phases of a typical bacterial growth curve. State the reasons for obtaining lag phase. 1 + 2 + 3 + 2
11. (a) Write a brief account on cell cycle. 6
(b) State the significance of meiosis. 2
12. What are disinfectant and antiseptic? Give one example of each. Describe the mode of action of the following antimicrobial agent: Phenols, halogens. 2 + 2 + 4

GROUP – C

Answer any five questions : 4 × 5

13. State the important differences between eukaryotic cell and prokaryotic cell. 4
14. Write a note on bacterial nucleoid. 4
15. Draw and briefly describe the structure of TMV. 4
16. What are the different types of nucleic acid found in viruses ? 4
17. Classify microorganisms on the basis of temperature requirement. 4
18. What are carboxysomes and PHB ? 2 + 2
19. (a) Name two diseases caused by chlamydias. 2
(b) State two importance of *Streptomyces*. 2

20. (a) Why dry heat is less effective than wet heat? 2
- (b) Distinguish bacteriocide and bacteriostatis. 2
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